

Appendix

Entering and Exiting the Buffer Space

At that time, the packet is allocated a buffer based on the following order of precedence:

1. Per-class reserved buffer
2. Shared pool buffer
3. Per-port reserved buffer

In other words, if possible, the packet is stored in a reserved region of memory corresponding to the packet's traffic class. If that region is full, the packet may be stored in any buffer located in the shared pool. As a last resort, if both the per-class reserved buffers and the shared pool buffers are fully occupied, then the packet may be stored in a reserved section of memory corresponding to the packet's source port. Storage of a packet in a particular region of buffer space is implemented by incrementing the appropriate buffer counter to indicate the new occupant.

For the buffer management scheme to work, the packet must carry a bit indicating whether the frame was stored in a per-class reserved buffer.

After transmission, the occupancy of each of the buffer sections must be updated. If the departing packet was stored in a per-class reserved buffer, then the appropriate per-class buffer counter should be decremented. On the other hand, if the departing packet was not stored in a per-class reserved buffer, then, of course, either the appropriate per-port buffer counter or the shared pool's

buffer counter needs to be decremented. The buffer should be returned based on the following order of precedence:

1. Per-port reserved buffer
2. Shared pool buffer

Note that, where possible, packets are stored in the shared buffer pool instead of the per-port reserved buffer pool. By contrast, where possible, packets are returned to the per-port reserved buffer pool instead of the shared buffer pool. Indeed, a source port's reserved buffers are used rarely and as a last resort, and are returned as soon as possible.

Dropping and Flow Control

If, according to the buffer management rules, a packet has nowhere to go, because the shared pool and reserved pools are all in use, then that packet is dropped.

The same scheme can be used for flow control. Flow control can be triggered when a port's per-source reserved buffers fall below a certain threshold. Because per-source reserved buffers are used only as a last resort, the scheme has the advantage of triggering flow control as little as possible.